

Patent Claims

5 1. Method to supply a defined fluid flow, especially for liquid chromatography,

10 a) in which a total flow (f_o) is split into an internal excess flow (f_{ie}) in an excess branch and an internal work flow (f_{iw}) in a working branch,

15 b) wherein the split ratio between the internal work flow (f_{iw}) and the internal excess flow (f_{ie}) is determined by the reverse ratio of a fluidic resistor (7) in the working branch and fluidic resistor (9) in the excess branch, and

20 c) where the excess branch and the working branch are interconnected at the outputs of the two fluidic resistors (7, 9) via a cross-branch,

25 d) in which the balance flow (f_{bal}) occurring between the outputs of the fluidic resistors (7, 9) is measured with a flow sensor (108),

30 e) where further down the working branch an external work flow (f_{ew}) can be supplied to an operating device downstream of the device (100), a chromatography column, for example,

35 f) after which further down the excess branch an adjustable resistance device (11) is installed,

5 g) where by control of the resistance value of the adjustable fluidic resistance device (110) the balance flow (f_{bal}) is regulated in such manner that the balance flow (f_{bal}) preferably is in the temporal median, generally equal to zero or equal to a preset offset value, whose value is small in comparison to the internal work flow (f_{iw}).

10 2. Method according to claim 1, wherein the preset offset value for the balance flow (f_{bal}) is greater than zero, whereby the positive sign indicates a flow from the working path in the direction of the excess path.

15 3. Method according to claim 1 or 2, wherein the dependency of the sensor signal (S_{bal}) of the flow sensor (108) on at least one property of the fluid, especially the thermal conductivity or thermal capacity of the fluid, is corrected in such fashion during the adjustment of the balance flow (f_{bal}) that the preset offset value for the balance flow (f_{bal}) results.

20 4. Method according to claim 3, wherein for the correcting purposes a correction parameter is linked to the sensor signal (S_{bal}), in particular a correction factor is multiplied with the sensor signal (S_{bal}).

25 5. Method according to claim 3 or 4, wherein the values for the correction factor are stored in a lookup table, or the functional dependency of the correction factor from at least one property of the fluid is stored.

6. Method according to one of the previous claims, wherein the balance flow (f_{bal}) in order to achieve a temporary reduction of the external work flow (f_{ew})

further down the working path is adjusted to a preset value that is high in comparison to the offset value.

5 7. Method according to one of the previous claims, **wherein** the resistance value if the adjustable fluidic resistance device for the determination of the internal work flow (f_{iw}) and/or external work flow (f_{ew}) further down the working path is temporarily set in such manner that a balance flow (f_{bai}) of unequal to zero results, and the internal work flow (f_{iw}) expected in normal operating mode and/or the external work flow (f_{ew}) is determined from the signal (S_{bai}) of the flow sensor (108).

10 8. Method according to claim 7, **wherein** the adjustable fluidic resistance device (110) is shorted for measuring the internal work flow (f_{iw}) in the cross-branch and/or adjusted to a value equal to zero, whereby the cross-branch preferably exhibits a fluidic resistance of equal to or near zero.

15 9. Device for the supply of a defined fluid flow, in particular for liquid chromatography,

20 a) with a fluidic junction (5) splitting a total flow (f_o) into an internal excess flow (f_{ie}) inside an excess branch and an internal work flow (f_{iw}) inside a working branch,

25 b) whereby the split ratio of the internal work flow (f_{iw}) and the internal excess flow (f_{ie}) is determined by the reverse ratio between a fluidic resistor (7) in the working branch and a fluidic resistor (9) in the excess branch.

- c) whereby the excess branch and the working branch are interconnected at the outputs of the two fluidic resistors (7, 9) by a cross-branch, and
- 5 d) whereby further down the working branch an external work flow (f_{ew}) may be supplied to a working device, a chromatography column, for example, which may be connected to the device (100),
- 10 e) with a flow sensor (108) between the outputs of the fluidic resistors (7, 9) in the cross-branch to measure the balance flow (f_{bal}),
- f) whose sensor signal (S_{bal}) is fed into a controller (112), and
- 15 g) with a controllable, adjustable fluidic resistance device (110) further down the excess branch, controllable by a control device (112),
- 20 h) whereby the controller (112) adjusts the balance flow (f_{bal}) by controlling the resistance value of the adjustable fluidic resistance device (110) in such manner that the balance flow (f_{bal}), preferably im zeitlichen Mittel, is zero or equal to a preset offset value, which is small in comparison to the internal work flow (f_{iw}).

10. Method according to claim 9, **wherein** the fluidic resistors (7, 9) are laid out in such fashion that their fluidic throughput time is generally equal.

11. Method according to claim 9 or 10, **wherein** the fluidic resistors (7, 9) are designed in such fashion that their fluidic throughput time is small in comparison to the duration of common solvent gradients.
- 5 12. Method according to claim 9 to 11, **wherein** the fluidic resistances (7, 9) are configured in such fashion that they always exhibit the same temperature.
13. Method according to claim 9 to 12, **wherein** the method according to one the claims 1 to 8 is executed by a controller (112).
- 10 14. Device according to one of the previous claims, **wherein** the total fluidic resistance value of the changeable fluidic resistance device (110) is composed of the resistance value of an adjustable, preferably electrically controlled fluidic resistance element (122) and a non-adjustable fluidic resistance element (120),
15 wherein the fluidic resistance value, especially that of the non-adjustable fluidic resistance element (120) is dependent on the viscosity of the solvent being used.